UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF COOPERATIVE EXTENSION WORK
THE BUREAU OF PLANT INDUSTRY COOPERATING

VOLUME 3 | JANUARY AND FEBRUARY, 1925 | NUMBERS 1 AND 2

The Extension Pathologist

"TO PROMOTE ECONOMIC CROP PRODUCTION,
IMPROVE THE QUALITY OF THE PRODUCTS, AND
REDUCE WASTAGE IN STORAGE, TRANSIT, AND AT THE MARKET"

THE EXTENSION PATHOLOGIST

Volume 3 Numbers 1-2

Contents of this issue

1958

Considerable travel, in January and February, combined with some absence on sick leave, has prevented me from assembling the January and February numbers of our news sheet on schedule time. I know, however, that, even if it does come a bit late, many of our readers will be interested in hearing the news concerning events at the extension conference held during the December meetings of the American Phytopathological Society. Consequently, considerable space in this number is devoted to a report on this meeting, which was very kindly prepared by a committee appointed for that purpose. We are very much indebted to Dr. R. A. Jehle, Mr. James Godkin, and Dr. C. D. Chupp for this service. -- F. C. M.

REPORT OF EXTENSION CONFERENCE, WASHINGTON, D. C. DECEMBER 30, 1924.

This session was well attended, over 50 plant pathologists being present and participating in the discussions. After preliminary remarks by F. C. Meier, who acted as chairman, the conference was addressed by the following speakers:

E. C. Sherwood, of West Virginia, discussed apple spray service:-

Mr. Sherwood drew a map of West Virginia, showing the location of the three most important fruit-growing regions of the State. He stated that he had a field laboratory, located in the panhandle section, in which studies were made as a basis for spray recommendations. There is one to two weeks' difference in stages of development of fruit trees in the different parts of the State, and frequently trips are made from the panhandle section to the other fruit-growing regions of the State. The time for the delayed dormant and petal fall applications depends upon the development of the tree, but studies of spore development are made to determine when to recommend the pink or pre-pink application. The use of standard materials was urged. Notices to growers are printed by the Martinsburg Journal the next morning after they are received, and are mailed out to those on the spray-service mailing list, who receive them the following afternoon. About six notices are sent out each season to about 400 growers. The notices are sent only to fruit growers who request the service.

F. D. Fromme, of Virginia, discussed apple spray service:-

Dr. Fromme stated that the work in Virginia began as research work and finally developed into extension work. A field laboratory is maintained at Winchester, with an entomologist and pathologist. Other field laboratories are maintained. The growers are advised on the time to spray, this advice being based upon field studies at the laboratories. Time for making recommendations is determined by a spray committee, consisting of representatives of the departments of pathology, horticulture, and entomology. The resultant information is forwarded to the county agents, who fill out cards and send out the information.

S. G. Lehman reported the work of G. W. Fant in spray service in North Carolina:-

Mr. Fant's work was chiefly with home orchards located in the Piedmont section of North Carolina. The work is conducted jointly with the departments of entomology and horticulture. A series of meetings is held to get in touch with the home orchardists. Talks are given in orchard management, illustrated by charts, photographs, and the like. Spray letters are sent out, giving information on spraying and pruning, and instructions are given regarding the time to apply material. Demonstrations are visited as frequently as possible. Responsibility for putting on sprays is left with the county agent. Efforts are made to have growers keep records of time of application, materials used, labor, and results. Attempts are made to have check trees left for comparison. Records from one of the orchards are as follows:

Check trees-	Sprayed trees-
2-1/2 bushels	4-1/2 bushels
2 bushels	3-3/4 bushels

E. L. Nixon, Pennsylvania:-

Mr. Nixon reported his problem in Pennsylvania as a dual one--the home orchard and the potato patch. He found the use of high-pressure outfits which could be adjusted for both orchard and potato spraying to be most successful. These outfits cost about $400.

M. F. Barrus, of New York:-

Spray service in New York has been conducted for about 10 years. Its object is to enable the growers to get better fruit. There are centers from which spraying information is given out. A field agent is hired for six months and is furnished with a car in which to get around. Some of these agents are financed from the farm bureau budget; others by growers. The college pays $50 a month of the salary of the field agent. The agents have the cooperation of the Weather Bureau, a special weather forecaster being located in Ithaca. Information is extended on other crops besides orchards.

E. F. Guba, New York:-

There are 12 field agents located in 14 counties, most of whom are college graduates. They are all assembled at Ithaca during the latter part of March to attend the extension school, where they are instructed in the things they are likely to need. The field assistant goes to the county April 1 and remains until October 1, where he makes recommendations and has a check orchard. They are supervised and assisted by the pathologist and entomologist at Ithaca. They are also assisted by the Geneva station, branch stations, and the Weather Bureau. The field agents and county agents send weekly letters to headquarters. Spray information service is used by 6,946 fruit and vegetable growers. Information is sent

out by telegram or circular letter. When conditions vary, the county is divided into zones for special information.

O. F. Burger, of Florida:-

Dr. Burger stated that they had difficulty in convincing the citrus growers that spraying is profitable. When trees are sprayed with a fungicide, scale-attacking fungi are killed and all fungicidal sprays must be followed by a spray to kill scale. They are attempting to get the county agents sufficiently interested to give out information when to spray.

Donald Folsom, of Maine:-

The work of correlating the life history of Venturia inequalis with the control of apple scab has just begun.

H. W. Barre, South Carolina:-

Cotton anthracnose was one of the first plant diseases studied in America. In Alabama, cottonseed was delinted with sulphuric acid, and the seed was treated. The anthracnose fungus also grows inside of the seed, so the treatment was only partially successful. Later, Rolfs and others continued the work. When the work was started in South Carolina, it was found that treated seed germinated more quickly and more easily than untreated seed. Angular leaf-spot of cotton (B. malvacearum) was completely controlled, while cotton anthracnose was only partially controlled. In addition to this, the acid-treated seed germinated more quickly and made quicker and earlier growth. An increase in yield of 100 to 200 pounds of seed cotton per acre was obtained. This increase was partially due to disease control. Seed is placed in a tub with 8 to 9 pounds of commercial sulphuric acid and left in until the lint is all gone (8 to 9 minutes). Nine to ten pounds of acid are required per bushel of seed treated. After treatment, the seed should be washed thoroughly.

Donald H. Porter, of Iowa:-

Mr. Porter reported on the hot-formaldehyde treatment for potatoes This treatment consists of soaking potatoes two minutes in formaldehyde (2 pints to 30 gallons water) at 118° to 120° F.) The work was done as a community project. Mr. Porter reported that all growers who tried it were well pleased with results and would treat again.

Charles D. Chupp, of New York:-

Dr. Chupp reported on hot corrosive-sublimate treatment of potatoes in New York. He reported that about 40,000 bushels were treated. Sometimes a private grower will treat for others at a rate of 10 cents per bushel.

L. E. Melchers, of Kansas, read E. A. Stokdyk's paper.

R. A. Jehle, of Maryland:-

The treatment of seed potatoes with formaldehyde or corrosive sublimate, preferably the latter, has been recommended throughout the State by the county agents and specialists for several years, and a large number of potatoes which are planted in the State are treated before they are cut. The greatest progress in seed treatment of potatoes has been made in Worcester county. At the potato meetings which were held in the county, the advantages of seed treatment were discussed, and the county agent announced that corrosive sublimate for seed treatment could be purchased in his office in 4-ounce packages. This method has been followed for four years with the following results: In 1921, about 3 pounds of corrosive sublimate was distributed by the county agent, and about 360 bushels of potatoes were treated; in 1922, about 10 pounds was distributed, and about 1,200 bushels were treated; in 1923, about 12 pounds was distributed, and about 1,440 bushels were treated; and this year, about 20 pounds was used, and about 2,400 bushels were treated. The same method has been recommended for sweet potatoes, resulting in the use of about 15 pounds of corrosive sublimate this year and the treating of about 1,800 bushels. In connection with potato meetings, the U. S. Department of Agriculture film, "Hidden Foes in Seed Potatoes," was shown and created a great deal of interest.

James Godkin, of Virginia:-

Mr. Godkin reported on the hot-water treatment for loose-smut of wheat. In certain parts of Virginia this work has been conducted for several years. Canning factories are being used for the treatment, farmers bringing in their seed, treating it, and taking it home. Practically no loose-smut can be found in fields from treated seed, while more or less is always present in fields from untreated seed.

After the speakers listed above had made their statements, opportunity was given for general discussion. In the course of this discussion, much interesting information bearing on methods of conducting the work was developed. Annual sessions of this sort should be of considerable value in assisting extension workers to plan their activities in the most effective way.-

R. A. Jehle,
James Godkin,
Charles Chupp.

Most of the men who participated in the conference outlined above have filed at this office papers containing the gist of matters brought out in their discussions. As opportunity presents itself, some of these will be printed in THE EXTENSION PATHOLOGIST. The following paper is one of the most interesting of these:

THE INTRODUCTION OF THE HOT-FORMALDEHYDE TREATMENT FOR SEED POTATOES IN IOWA

By D. R. Porter, Formerly Extension Plant Pathologist, Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa

The hot-formaldehyde method for treating seed potatoes was introduced into Iowa as a project of the agricultural extension service. This project was one of the first used by the plant pathology department of the extension service, and during the period from 1918 to 1922 it was carried to every important potato-growing section in the State.

The Project, "Control of Potato Diseases"

Although Iowa ranked in eleventh place among the potato-growing States in 1919, there are very few areas in the State where this crop is grown intensively. In fact, the annual yield of potatoes in Iowa is insufficient to supply the demand, and potatoes are shipped in every year. The crop is usually third or fourth in importance within the State.

Hence this potato-disease project served comparatively few large growers. It was attractive, chiefly, to the small grower who raised from 1 to 10 acres, yet, during the past six years, control practices have found a permanent place among farming operations.

Prior to the time when this project was released to the extension service, the Iowa Agricultural Experiment Station had carried on careful investigations in order to determine the most practical, efficient, and economical method of treating seed potatoes, and had found the hot-formaldehyde dip to be the best of any that were tried in controlling scab (*Actinomyces scabies*), and Rhizoctonia or black-scurf (*Corticium vagum solani*).

This dip was made by mixing 2 pints of 40 per cent formaldehyde in 30 gallons of water. This solution was then heated to a constant temperature of 118° to 122° Fahrenheit, the tubers immersed for 2 minutes, drained, covered for a short time, and planted.

How the Iowa Farmer Learned To Do It

This information made it possible to prepare a very attractive extension project to submit to the county farm bureau. Almost at once calls began to come in from the counties for assistance in treating their potatoes. The plant-disease specialist found his time taken from February to April. He went out into the county, supervised the setting up of treating equipment, assisted with the treating, and discussed the various potato diseases and their control with the growers.

The first of these demonstrations was held in 1918. By 1919 the demand for service had increased to such proportions that the specialist could not fill it. It was seldom necessary to repeat a demonstration in a community, and by 1921 farmers and county agents had become sufficiently familiar with the hot-dip method to treat without much supervisory assistance. By 1922 there was still less demand on the time of the specialist, and no demonstrations were held in 1923 or 1924. This does not mean that the project had died. It does mean that the project lives on, and that its efficiency has been increased many times through the education of the potato grower.

During the five-year period from 1918 to 1922, rapid strides were made by the potato grower in successfully preventing scabby and scurfy potatoes. He learned that a 2-minute seed treatment would not only reduce the extent of disease in the crop, but would also increase his yields. He learned that the treatment was cheap, easy, and practical. In short, he was convinced that seed treatment was a sound investment, a paying precaution, and good insurance.

The hot method, however, was not without its shortcomings. Growers had difficulty in setting up a treating device and in maintaining the strength and temperature of the solution. The Iowa station designed a treating device, which was sent out over the State for demonstration purposes, but in most cases the farmer, sometimes with the assistance of the specialist, devised his own outfit. Quite often the equipment would accommodate only a single crate of potatoes at a time; in some cases an old ash or garbage can was used into which was inserted a small tank heater.

How the Growers Treated.

A. C. Bartz, of Toeterville, used a large steel tank holding about 250 gallons, into which was placed a steam feed cooker and a tank heater. Dr. C. E. Johl, of Osage, used a tank heater supplied by the extension service in a 75-gallon steel tank and obtained excellent results. Charles Penny, of Stacyville, used the same method. A. W. Beyer, of Mitchell, used a steam engine to furnish the heat in a 150-gallon tank. Three crates were dipped at a time. In this way 200 bushels were treated in a half day. L. C. Barnett, of Mitchell, fixed up a tank holding about 75 gallons of water by simply digging a trench in the ground, putting stove pipe at one end, and using old pine boards for fuel at the opposite end, the flame going underneath the tank. By this method, 140 bushels were treated in four hours. It was common practice to treat all the seed in one community at a creamery by using steam heat in a large tank. It was found, however, that steam coils were better than live steam, since the latter would condense in the solution and decrease the concentration. If live steam is used, it is necessary to add more formaldehyde from time to time.

As seed treating progressed, the quality of the equipment increased. In many places steam engines were used to supply the heat. In one locality the seed was treated as it was unloaded from the car by using a 10 by 3 by 3 wooden tank with one end inserted in the car door and the other resting on a platform of the same height. Many other instances might be cited dealing with the method of treating, indicating that here is something that Iowa potato growers have been quick to grasp. They have found an easy, practical

efficient, and inexpensive method of increasing the quality and quantity of their crop.

In order to determine what success Iowa potato growers were having with the hot-dip method, questionnaires were recently sent to the leading growers in Iowa. This questionnaire was designed to find out what the grower thought of the hot method, what it cost, what control it was giving, and what sort of equipment he was using.

The replies indicate that the hot method is popular among Iowa growers. Some made statements to the effect that treating represented a difference between a good crop and no crop. One grower reduced scab and scurf from 30 per cent to 5 per cent or less, his seed-treated crop passing the U. S. Government inspector as U. S. #1, while his untreated crop from the same seed was unfit to ship.

A few of the most typical replies to this questionnaire are given here, since they tell the story straight from the shoulder.

Sam Kennedy, Jr., one of the leading potato and truck growers in Cerro Gordo County, writes as follows: "In regard to hot-formaldehyde treatment of seed potatoes, we have used this treatment every year since it was first introduced by I. E. Melhus several years ago. We have had what we consider very satisfactory results with the hot treatment; nothing like 100 per cent efficiency, of course, but enough control to make a marketable product. Our lands here seem to be full of scab, and without the use of some control measure, they are very apt to give an undesirable quality of potatoes.

"Our treating equipment consists of a 5-horsepower upright steam boiler connected by a steam hose to an ordinary galvanized stock tank. We always handle our potatoes in crates, immersing 4 crates at a time. Upon removing crates from the tank, we place them upon a sloping shelf alongside the tank, which allows the excess liquid to drain back into the tank.

"We use the same crates to carry the cut seed to the planter, so there is little danger of contamination. We carry on the work of treating the seed potatoes under cover and generally do it in the spring just before spring work in the fields opens up. Five or six hundred bushels a day can easily be treated by four men using the above-described equipment.

"The cost of the treatment per bushel is very light, less than 1 cent per bushel for formaldehyde, and a small charge for fuel and repairs on equipment, the main expense being the labor of handling the potatoes and keeping the boiler fired up.

"A total of 5 cents per bushel would cover every item of expense, including interest and depreciation of equipment, when 1,000 bushels per year are treated.

"The hot-dip method makes a short job of treating seed potatoes, and according to our experience highly repays the small expense incurred."

C. G. Goplerud, an interested grower in Mitchell County says: "I wish to state that we have treated potatoes by this method cooperatively for the past three years with very good results for controlling scab. We have treated approximately 1,000 bushels every year, using a steam engine, and running the steam into a tank large enough to accommodate about 25 bushels in crates at a time.

"The farmers bring their potatoes to some central farm place to be treated. This has been done at a cost of about 5 cents a bushel or a little less, depending on the number of bushels treated during the day."

Hoyt E. Buttolph, also of Mitchell County, has given the hot method a careful test against the cold, and writes as follows:

"I have used both the hot and cold method of treating seed potatoes for five years, and because of the saving in time and the greater effectiveness have decided to use only the hot treatment hereafter. The past season showed the results of seed treatment remarkably well. I have no exact figures, but I think from the appearance of the crop, that I reduced the scab from approximately 30 per cent to 5 per cent or less. My seed-treated crop passed U. S. Government inspectors as U. S. #1, 3 per cent imperfects, and most of the imperfections were for growth cracks.

"My crop of untreated potatoes, grown from the same seed, was not fit to ship and had to be peddled out to less exacting buyers at a reduction of 10 cents per bushel.

"My method of treating is inexpensive and not difficult for one man to do alone. I rig up a pulley in a tree and use a half-inch rope into which I have tied a sort of double hook, made from wagon-box rods. I have the potatoes to be treated in flat crates, size 12 by 14 by 20, which hold about 70 pounds. My solution is contained in a 50-gallon kettle mounted on the sheet-iron fire box that usually comes with a kettle. By placing two empty crates along the kettle I have a stand on which to place my crate to be treated. On the opposite side of the kettle I have a stand of correct height and a drain board made of sheet iron, on which the crates are placed to drain after treating. After a little practice, one can keep the solution at 120° to 122° F. and treat and carry away to steam, about 30 bushels of potatoes per hour, at a cost about as follows:

1 man per hour.....40 cents.
1 quart formaldehyde.....45 cents or less.
Fuel and cobs.....no charge.

or about 3 cents per bushel in small lots and down to less than 2 cents in larger lots. I think I have the easiest one-man equipment of any I have yet seen."

E. G. Nelson, of St. Ansgar, has used the hot dip for several years, and it is his opinion that it pays well. In 1923, he treated almost 1,300 bushels in one day at a cost of about 4 cents per bushel. A steam engine furnished the heat. He favors the community idea of treating.

Wayne Spaulding, of Mitchell, says in part:

"Last year, my seed potatoes were very rough and scabby, but the crop this fall was smooth and almost disease-free. Judging from the improvement brought about by the hot dip, I am sure that by treating every year, potatoes may be produced nearly free from scab and scurf."

E. J. Hallaty, of St. Ansgar, found that by using a steam engine to supply the heat, three men could treat 800 bushels at a cost not exceeding 4 cents. He is satisfied that it pays to treat for home use as well as for sale.

Not only have Iowa growers taken kindly to this method, but growers in other States as well. E. A. Stokdyk, extension plant pathologist in Kansas, reports very favorable results with the hot dip. He reports in part

"In Douglas County, several comparative tests between the hot-formaldehyde and corrosive-sublimate treatments were witnessed. The hot-formaldehyde plots showed almost perfect control of Rhizoctonia, and the corrosive sublimate plots showed 80 per cent control, but the untreated plots were from 80 to 100 per cent infected. The hot-formaldehyde plots showed the 4-minute treatment giving the best control, although the vine vigor was reduced. Three pints of formaldehyde instead of two to 30 gallons gave better control of Rhizoctonia. Tests made with seed treated in the fall instead of the spring showed the fall treatment to be just as effective as the spring treatment. It is believed that this will be a great aid to the grower by showing him that he can treat his seed in the fall when he is not extremely busy and then can devote all his time to his planting in the spring.

"In Wyandotte County, the seed-treatment plots showed on the average 80 per cent of diseased plants in the untreated, 20 per cent diseased in the plots treated with corrosive sublimate, and 10 per cent diseased in the plots treated with hot formaldehyde."

According to R. C. Rose, extension plant pathologist in Minnesota, the hot-dip method is gaining rapidly in popularity in that State, due chiefly to the saving in time effected by a 2-minute treatment. Some individual growers set up their own equipment, but many others found it more satisfactory to cooperate with the neighbors, all using the same equipment. In such cases, the cost of treating was about 4 cents per bushel. Mr. Rose supervised the treating of over 3,000 bushels in 1923 in Winona County alone.

E. M. Page, from Missouri, reports that the hot dip is now being used extensively in that State. He has found that no detrimental effects have come from lengthening the time of treatment to as much as 4 minutes. The large grower in Missouri is advised to use the hot dip.

Use of Treating Machines

There are at least two commercial seed-treating machines on the market. One called the Breen is manufactured by H. L. Breen, of the Hatton Hardware Co., of Hatton, N. Dak. One of these is in use at the Iowa Experiment Station, and gives very good results where the quantity to be treated is not too large. Growers in Kansas have found this machine satisfactory, and V. C. Beverly, county agent at Presque Isle, Me., states that 25 growers there purchased this machine last spring. Heat is supplied by a kerosene flame. This machine is very practical on the average farm, and its effectiveness certainly justified its cost.

Recently, E. D. Askegaard, a specialist in seed-potato production, at Moorhead, Minn., and a grower who uses the hot-dip method, has devised a very efficient machine for treating seed potatoes by the hot-dip method. He writes that Albert Miller & Co., of Chicago, probably the most extensive growers and dealers in potatoes in the Middle West, use this machine for treating their seed potatoes, and plan to stick with this machine this coming year.

Zuckerman Bros., of Stockton, Calif., probably the largest growers in the United States, have decided to change from corrosive sublimate to the hot dip. They plant about 25,000 sacks of seed annually, on 1,600 acres in 8 different localities in the State.

The above are only two of many similar decisions by large growers in many different States who make inquiry regarding the hot-dip method of potato-seed treatment. The list might be multiplied from almost all the important potato-growing States.

Iowa has done the pioneer work, both experimentally and through practical application of the hot-dip method. Iowa has carried it through the experimental stage and has been able to demonstrate its use to potato growers who have come to adopt it as part of their farm practice.

It is effective, practical, easy, and inexpensive. It increases yield and quality as well as any other known method of seed treatment. It makes possible the treatment of large quantities of seed in a short time and at any time before planting. Fall treating hasgiven good results. It makes possible the treating of potatoes as they are unloaded from the car. It is an easy method to demonstrate because of the saving in time, labor, and materials. One demonstration "sells" the method to a grower who has more than 25 bushels to treat.

NEWS NOTES

Changes in Kansas Personnel

Extension workers, who have been following the work in plant pathology in Kansas, realize that considerable progress has been made in that State in the past few years. These results were brought about by able

and untiring efforts on the part of E. A. Stokdyk. Several years ago he became associated with the department of botany and plant pathology, and after his work was carefully planned for three or four years in advance he set about to put his program across. Those who know Mr. Stokdyk can see how he was able to accomplish the outstanding results in potato and sweet-potato work and his work in cereal smuts. His pleasing personality and ability won the confidence and respect of county agents and farmers throughout the State.

"It was with a great deal of regret that we had to allow Mr. Stokdyk to go into a new dield," states L. E. Melchers. "He has created a demand for work in plant pathology over the State, and the position he left open which had to be filled by some one else was not an easy position to fill. The potato growers especially have been spoiled by the good work of Mr. Stokdyk. However, there is one consolation—he will not leave the Kansas State Agricultural College, but will merely take over the work as marketing specialist. We know that he will not forget about plant pathology. In fact, instead of having one man interested in plant pathology in the State, we shall now have two--Mr. Stokdyk's successor and himself.

"Considerable thought was given to who the person should be who should fill the vacancy as extension plant pathologist. It was decided to offer the position to Donald Porter, formerly extension pathologist at Ames, Iowa. Mr. Porter accepted the position in Kansas and expects to be on the job by the middle of February.

"Mr. Porter will have a difficult position to fill as successor to E. A. Stokdyk, but the various people at Manhattan are satisfied that a man from the Middle West and one who has done the splendid work that Mr. Porter has in Iowa will pick up the loose threads in extension work in Kansas and keep the work going without a setback. Mr. Porter is well trained for the work and has had experience in extension work. Those who are personally acquainted with him know that his work has been a great success in Iowa. His friends in that State are just as sorry to see him go as Kansas is glad to have him come."

Word from Washington

The following letter from George L. Zundel reached the office too late to be included in either the November or December numbers; consequently, we are printing it now, with apologies to Mr. Zundel for ths delay:

"Pullman, Wash., November 1, 1924.

"I have just completed my annual report, and want to make note of one or two results that I think could very well be used in our "Extension Pathologist."

"The other day I was down in Wahkiakum County checking up on some of our results. One of the things that we have been working on on the west coast is the control of the maggot that attacks the cabbage and other cruciferous crops. I found that in previous years it had been an impossibility for certain people to raise cabbage. For that reason, in 1923, County Agent F. S. Martin got T. M. Bowman of Cathlamet to try the use of corrosive sublimate, mixing up about 1 ounce of the corrosive sublimate in 10 gallons of water and pouring an ordinary cupful around the plants every week or 10 days. The results on Mr. Bowman's farm in 1923 were very gratifying. As a result, during 1924, 28 ounces of corrosive sublimate were distributed to 23 farmers of Wahkiakum County. I had the privilege of visiting some of the patches and found that this method gave complete satisfaction in controlling the root maggot on cabbage. In one place, particularly, the man told me that he had 85 per cent control. Where in previous years he had had no cabbage whatever, this year he has enough cabbage for his own use and enough to supply his neighbors and the county agent. This is a wonderful spread of influence for such a small county as Wahkiakum, where the farms are very small and where there are few backwoodsman farmers. The majority of the farmers in this county are in reality fishermen, and farming is only a side issue with them.

"With respect to our copper-carbonate work, I am going to give you a number of extracts from some of our county agents' reports:

County Agent Harold Simonds, of Franklin County, reports:

"A very small number of farmers still adhere to the wet treatment against smut. Use of copper carbonate is an accepted practice."

County Agent N. C. Donaldson, of Adams County, says:

"The majority of farmers in the county are now using the copper-carbonate method of treating wheat."

County Agent A. W. Kasten, of Walla Walla County, says:

"Copper carbonate is rapidly replacing bluestone as a fungicide for wheat treatment. This fall, 36,500 pounds of copper carbonate were supplied by the farm bureau, which was enough for about 150,000 acres of wheat. The demand for copper carbonate increased about 25 per cent over the demand in 1923."

County Agent O. V. Patton, of Spokane County, says:

"The new dry treatment (copper carbonate) for seed wheat is now in such general use that no further demonstrations are necessary."

County Agent F. H. Zentner, of Douglas County, says:

"Demonstrations of the dry method of wheat treatment have convinced 80 per cent of the farmers."

County Agent C. H. Bergstrom, of Skagit County, says with respect to oats in his county:

"This year 1,830 acres were treated with copper carbonate. Two groups of farmers have each purchased grain-treating machines. The averag acreage reached by these machines amounts to 400 acres."

County Agent A. R. Chase, of Grant County, says:

"Of the estimated 180,000 acres of wheat sown last year, over one-half was seeded after using the new dry treatment, which saved at least 5,000 bushels of wheat."

"I hope that this information will be of use to you."-

George L. Zundel.

Announcement of Field Meetings

Dr. M. F. Barrus, chairman of the advisory board of the American Phytopathological Society, has asked me to assist in getting advance information concerning tours and field meetings. It is his thought that when meetings that will be of interest generally to plant pathologists are scheduled, these should be announced in "Phytopathology." A similar notice might be placed in "The Extension Pathologist," and in the latter publication notice might also be given of meetings of local interest.

In order that this plan may be carried out, please send in information concerning any field meetings or tours scheduled in your State for spring or summer. Dates, names of men in charge of territory involved, things to be seen, and hotel accommodations, are all matters on which information should be given. Notes of this sort should be addressed to F. C. Meier, Extension Plant Pathologist, Bureau of Plant Industry, Washington, D. C.- F.C.M.

"Why Strawberries Grow Whiskers"

A one-reel motion picture, carrying the above title, has just been completed under the direction of Dr. Neil E. Stevens, Office of Fruit Diseases, U. S. Department of Agriculture. In this film the importance of careful handling, early picking, and low temperatures is emphasized. Several copies of the film are being prepared and will be available for use by extension workers. If you are interested in using this film, a booking may be made by addressing F. W. Perkins, in charge Motion Pictures, U. S. Department of Agriculture.

EXTENSION LITERATURE

When making out your mailing list for literature dealing with the subject of plant-disease control, please do not forget this office. We are glad to cite all literature of this sort which is sent in.

The following publications were listed in a notice of new bulletins sent out January 14 by the office of publication, New York State College of Agriculture:

Extension Bulletins

87 Grading, packing and handling head lettuce in New York State.
89 Home orchard and fruit garden.
95 Growing peas for the canning factory.
96 Growing tomatoes for the canning factory.
97 Growing sweet corn for the canning factory.
98 Production and marketing of field beans.

Experiment Station Bulletins

429 Control of bacterial blight of celery by spraying and dusting.

News notes, extension articles, or suggestions with regard to subjects that might be discussed profitably in this news sheet should be addressed to:

Fred C. Meier,
Extension Plant Pathologist,
Bureau of Plant Industry,
United States Department of Agriculture,
Washington, D. C.

----oOo----